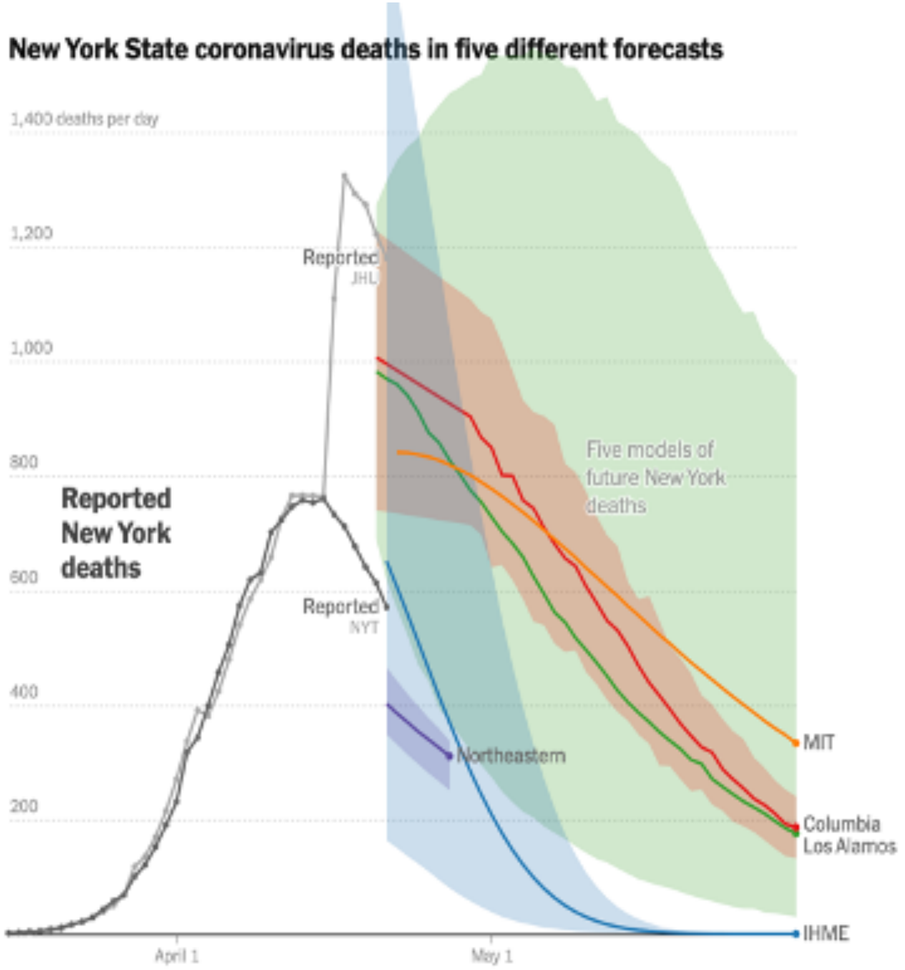
What can we do with the SIR model?

Forecasts

Given where we are now, where will we be in *n* days?



https://www.nytimes.com/interactive/2020/04/22/upshot/coronavirus-models.html

$$\frac{dS}{dt} = -\beta IS$$

$$\frac{dI}{dt} = \beta IS - \gamma I$$

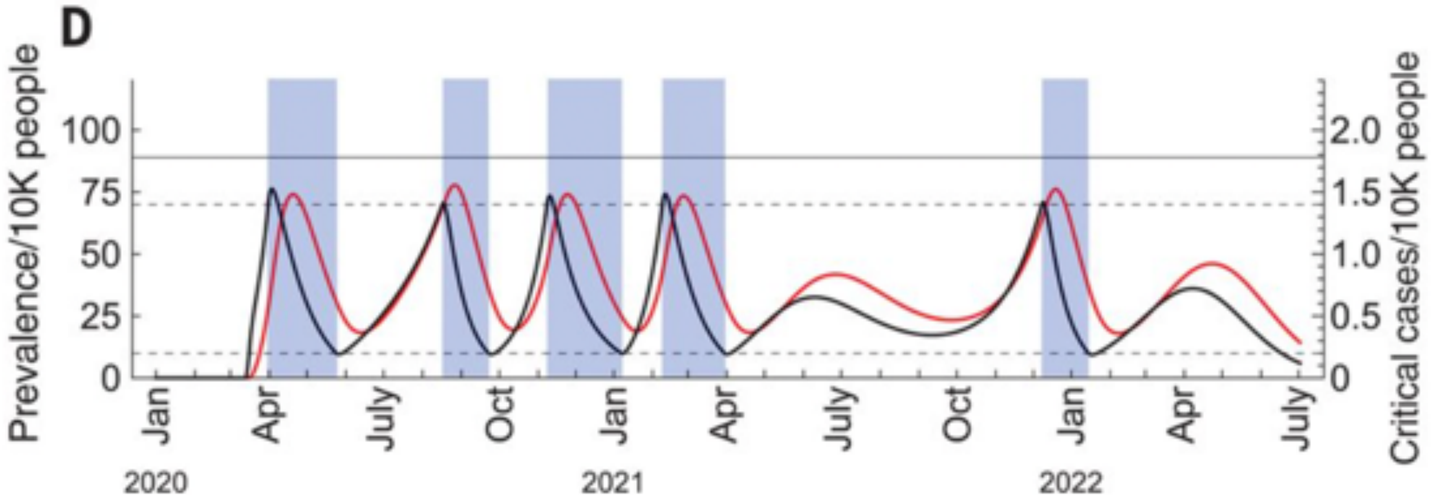
$$\frac{dR}{dt} = \gamma I$$

Just take these equations with plausible values for β and γ, and solve (simulate) them like we did on the previous slides!

What can we do with the SIR model?

Projections

If we make a given change, how do we expect the epidemic to behave?



Kissler, Tedijanto, *et al.* (2020)

$$\frac{dS}{dt} = -\beta IS$$

$$\frac{dI}{dt} = \beta IS - \gamma I$$

$$\frac{dR}{dt} = \gamma I$$

To approximate periodic physical distancing, we can reduce β during the blue shaded regions above.

Then, we solve (simulate) the equations and can ask:

How effective will distance be at reducing cases?

How long will distancing need to continue to keep control of the epidemic?